

Contents

List of Contributors IX

Foreword XIX

Preface XXIII

Part One Identification and Validation of New Drugs and Targets 1

- 1 **Discovery of the Mechanism of Action of Novel Compounds That Target Unicellular Eukaryotic Parasites 3**
Daniela Begolo and Christine Clayton*
- 2 **Antiparasitics from Algae 41**
*Stefan Ringgeler and Barbara Kappes**
- 3 **Contribution of Natural Products to Drug Discovery in Tropical Diseases 75**
Frederick Annang, Olga Genilloud, and Francisca Vicente*
- 4 **Isoxazoles: A Novel Chemotype Highly Effective on Ectoparasites 105**
*Tina Weber and Paul M. Selzer**
- 5 **Trypanosomal Cysteine Peptidases: Target Validation and Drug Design Strategies 121**
*Elany Barbosa da Silva, Glaécia Aparecida do Nascimento Pereira, and Rafaela Salgado Ferreira**
- 6 **Potential of Pyrimidine Metabolism for Antitrypanosomal Drug Discovery 147**
*María Valente, Antonio E. Vidal, and Dolores González Pacanowska**

7	Phosphatidylcholine and Phosphatidylethanolamine Biosynthesis Pathways in <i>Plasmodium</i> 171 <i>Ewelina Guca, Alicia Contet, Henri J. Vial, Kai Wengelnik, and Rachel Cerdan*</i>
8	Immunophilins as Possible Drug Targets in Apicomplexan Parasites 193 <i>Alessandra Bianchin*, Anthony J. Chubb, and Angus Bell</i>
9	Targeting the Atg8 Conjugation Pathway for Novel Anti-Apicomplexan Drug Discovery 213 <i>Alexia S. Miller and Jürgen Bosch*</i>
10	Turnover of Glycosomes in Trypanosomes – Perspectives for Drug Discovery 231 <i>Ana Brennand, Eva Rico, Melisa Gualdrón-López, and Paul A.M. Michels*</i>
11	Glideosome of Apicomplexans as a Drug Target 255 <i>Lauren E. Boucher and Jürgen Bosch*</i>
12	N-Myristoyltransferase as a Target for Drug Discovery in Malaria 275 <i>James A. Brannigan and Anthony J. Wilkinson*</i>
	Part Two Metabolomics in Drug and Target Discovery 295
13	Methods to Investigate Metabolic Systems in <i>Trypanosoma</i> 297 <i>Maria Fatarova, Florian Bellvert, Edern Cahoreau, Frédéric Bringaoud, and Jean-Charles Portais*</i>
14	The Role of Metabolomics in Antiparasitic Drug Discovery 321 <i>Carlo R. Giannangelo, Katherine M. Ellis, Anna E. Sexton, Daniel Stoessel, and Darren J. Creek*</i>
15	The Importance of Targeting Lipid Metabolism in Parasites for Drug Discovery 343 <i>Simon A. Young, Matthew D. Roberts, and Terry K. Smith*</i>
16	Carbon Metabolism of <i>Plasmodium falciparum</i> 371 <i>Marco Biddau and Sylke Müller*</i>
	Part Three Gene Expression and Its Regulation – A Promising Research Area for Drug Discovery 399
17	Epigenetic Gene Regulation: Key to Development and Survival of Malaria Parasites 401 <i>Sabine Anne-Kristin Fraschka and Richárd Bártfai*</i>

18	Mechanisms Regulating Transcription in <i>Plasmodium falciparum</i> as Targets for Novel Antimalarial Drugs 421 <i>Evelien M. Bunnik and Karine G. Le Roch*</i>
19	Aminoacyl t-RNA Synthetases as Antimalarial Drug Targets 441 <i>Anmol Chandele* and Amit Sharma</i>
	Part Four Mathematical Approaches to Drug and Target Discovery 455
20	Mathematical Modeling and Omic Data Integration to Understand Dynamic Adaptation of Apicomplexan Parasites and Identify Pharmaceutical Targets 457 <i>Partho Sen, Henri J. Vial, and Ovidiu Radulescu*</i>
21	Understanding Protozoan Parasite Metabolism and Identifying Drug Targets through Constraint-Based Modeling 487 <i>Francis Isidore Totanes, Sanu Shameer, David R. Westhead, Fabien Jourdan, and Glenn A. McConkey*</i>
22	Attacking Blood-Borne Parasites with Mathematics 513 <i>David D. van Niekerk, Gerald Penkler, François du Toit, Jacky L. Snoep, Barbara M. Bakker, and Jurgen R. Haanstra*</i>
	Index 543